

## 2.13 Air Quality

### 2.13.1 Regulatory Setting

The Clean Air Act as amended in 1990 is the federal law that governs air quality. Its counterpart in California is the California Clean Air Act of 1988. These laws set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). Standards have been established for six criteria pollutants that have been linked to potential health concerns; the criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM), lead (Pb), and sulfur dioxide (SO<sub>2</sub>).

Under the 1990 Clean Air Act Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve Federal actions to support programs or projects that are not first found to conform to State Implementation Plan for achieving the goals of the Clean Air Act requirements. Conformity with the Clean Air Act takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved.

Regional level conformity in California is concerned with how well the region is meeting the standards set for carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), and particulate matter (PM). California is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans (RTP) are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the RTP, an air quality model is run to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If the conformity analysis is successful, the regional planning organization, such as Southern California Association of Governments (SCAG) and the appropriate federal agencies, such as the Federal Highway Administration, make the determination that the RTP is in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project-level also requires “hot spot” analysis if an area is “nonattainment” or “maintenance” for carbon monoxide (CO) and/or particulate matter. A region is a “nonattainment” area if one or more monitoring stations in the region fail to

attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called “maintenance” areas. “Hot spot” analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the CO standard to be violated, and in “nonattainment” areas the project must not cause any increase in the number and severity of violations. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

### **2.13.2 Affected Environment**

An Air Quality Assessment (May 2010) was prepared as part of the proposed project to assess the impacts of the project on air quality locally and regionally. The information presented in this section is based on the results of the technical study.

#### **2.13.2.1 Environmental Setting**

The proposed project is located within the South Coast Air Basin (SCAB), a 6,600-square-mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. Air quality regulation in the SCAB is administered by the SCAQMD. The SCAB includes Orange County and the nondesert parts of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Geronio Pass area of Riverside County. Its terrain and geographical location determine the distinctive climate of the SCAB, as it is a coastal plain with connecting broad valleys and low hills.

The SCAB is characterized as having a “Mediterranean” climate (a semiarid environment with mild winters, warm summers, and moderate rainfall). The general region lies in the semipermanent high-pressure zone of the eastern Pacific. As a result, the climate is mild and tempered by cool sea breezes. The climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the SCAB is a function of the area’s natural physical characteristics (weather and topography), as well as man-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of pollutants throughout the SCAB.

### **2.13.2.2 Climate**

The average annual temperature varies little throughout the SCAB, averaging approximately 75 degrees Fahrenheit (°F). However, with a less pronounced oceanic influence, the eastern inland portions of the SCAB show greater variability in annual minimum and maximum temperatures. All portions of the SCAB have had recorded temperatures over 100°F in recent years. January is usually the coldest month at all locations, while July and August are usually the hottest months of the year. Although the SCAB has a semi-arid climate, the air near the surface is moist because of the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the SCAB by off-shore winds, the ocean effect is dominant. Periods with heavy fog are frequent; low stratus clouds, occasionally referred to as “high fog,” are a characteristic climate feature. Annual average relative humidity is 70 percent at the coast and 57 percent in the eastern part of the SCAB. Precipitation in the SCAB is typically nine to 14 inches annually and is rarely in the form of snow or hail due to typically warm weather. The frequency and amount of rainfall is greater in the coastal areas of the SCAB.

Within the project vicinity, the Cities of San Juan Capistrano, Dana Point, and San Clemente experience fairly mild weather, with temperatures typically ranging from 40°F in the winter to 79°F in the summer. On average, the warmest months are August and September, with a mean temperature of approximately 79°F. The coolest months are December and January, with a mean average of 44°F. The project vicinity experiences the greatest amount of precipitation in the month of February.

The area in which the proposed I-5 HOV Lane Extension Project is located offers clear skies and sunshine; however, it is still susceptible to air inversions. This traps a layer of stagnant air near the ground, where it is further loaded with pollutants. These inversions cause haziness, which is caused by moisture, suspended dust, and a variety of chemical aerosols emitted by trucks, automobiles, furnaces, and other sources.

### **2.13.2.3 Air Quality Management**

Pursuant to the Clean Air Act, the U.S. EPA has established NAAQS for the following air pollutants: CO, O<sub>3</sub>, NO<sub>2</sub>, SO<sub>2</sub>, particulate matter less than 10 and 2.5 microns in diameter (PM<sub>10</sub> and PM<sub>2.5</sub>, respectively), and Pb. These pollutants are referred to as criteria pollutants because numerical criteria have been established for each pollutant, which define acceptable levels of exposure. The United States EPA has revised the NAAQS several times since their original implementation and will continue to do so as the health effects of exposure to air pollution are better understood.

The California Air Resources Board (CARB) administers air quality policy in California. States with air quality that did not achieve the NAAQS were required to develop and maintain State Implementation Plans (SIPs). These plans constitute a federally enforceable definition of the State's approach (or "plan") and schedule for the attainment of the NAAQS. Air quality management areas were designated as "attainment," "nonattainment," or "unclassified" for individual pollutants depending on whether or not they achieve the applicable NAAQS and California Ambient Air Quality Standards (CAAQS) for each pollutant. It is important to note that because the NAAQS and CAAQS differ in many cases, it is possible for an area to be designated attainment by the EPA (meets NAAQS) and nonattainment by CARB (does not meet CAAQS) for the same pollutant. The NAAQS and the CAAQS are summarized in Table 2.13-1.

The SCAB is an attainment area for CO, NO<sub>2</sub>, and SO<sub>2</sub> for both State and federal standards. The SCAB is a nonattainment area for O<sub>3</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> under both State and federal standards; refer to Table 2.13-2.

Sensitive populations are more susceptible to the effects of air pollution than the general population. Sensitive populations (sensitive receptors) that are in proximity to localized sources of toxics and CO are of particular concern. Land uses considered sensitive receptors include residences, motels/hotels, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. The total distance of the proposed project is approximately 5.4 miles. Sensitive receptors located near the proposed project segment include residential uses, motels, hotels, schools, parks, and church uses. Within the City of San Juan Capistrano, the project site is immediately surrounded by commercial uses. However, within the City of Dana Point and the City of San Clemente, the project site is surrounded by mostly residential uses.

#### **2.13.2.4 Air Quality Monitoring**

The SCAQMD operates several air quality monitoring stations within the SCAB; refer to Table 2.13-3. The closest monitoring stations are located in the cities of Mission Viejo and Costa Mesa. Each monitoring station is located within a Source Receptor Area (SRA). The communities within an SRA are expected to have similar climatology and ambient air pollutant concentrations. The study area is located within the Cities of San Juan Capistrano, Dana Point, and San Clemente, which are located in SRA 21 (Capistrano Valley). Although there are no monitoring stations within SRA 21, the Mission Viejo Monitoring Station is located in SRA 19 and the Costa Mesa Monitoring Station is located in SRA 18. The monitoring stations usually measure pollutant concentrations

**Table 2.13-1 National and California Ambient Air Quality Standards**

Pollutant	Averaging Time	California Standards <sup>1</sup>		Federal Standards <sup>2</sup>		
		Concentration <sup>3</sup>	Method <sup>4</sup>	Primary <sup>3,5</sup>	Secondary <sup>3,6</sup>	Method <sup>7</sup>
Ozone (O <sub>3</sub> )	1 Hour	0.09 ppm (180 µg/m <sup>3</sup> )	Ultraviolet Photometry	--	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m <sup>3</sup> )		0.075 ppm (147 µg/m <sup>3</sup> )		
Respirable Particulate Matter (PM <sub>10</sub> )	24 Hour	50 µg/m3	Gravimetric or Beta Attenuation	150 µg/m3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m3		--		
Fine Particulate Matter (PM <sub>2.5</sub> )	24 Hour	No Separate State Standard		35 µg/m3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m3	Gravimetric or Beta Attenuation	15.0 µg/m3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m <sup>3</sup> )	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m <sup>3</sup> )	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m <sup>3</sup> )		35 ppm (40 mg/m <sup>3</sup> )		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m <sup>3</sup> )		--	--	==
Nitrogen Dioxide (NO <sub>2</sub> ) <sup>8</sup>	Annual Arithmetic Mean	0.030 ppm (57 µg/m <sup>3</sup> )	Gas Phase Chemiluminescence	53 ppb (100 µg/m <sup>3</sup> ) See footnote 8	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (339 µg/m <sup>3</sup> )		100 ppb (188µg/m <sup>3</sup> ) See footnote 8	None	
Sulfur Dioxide (SO <sub>2</sub> )	24 Hour	0.04 ppm (105 µg/m <sup>3</sup> )	Ultraviolet Fluorescence	--	--	Ultraviolet Fluorescence; Spectrophotometry (Paraosaniline Method) <sup>9</sup>
	3 Hour	--		--	0.5 ppm (1300 µg/m <sup>3</sup> ) See footnote 9	
	1 Hour	0.25 ppm (655 µg/m <sup>3</sup> )		75 ppb (196 µg/m <sup>3</sup> ) see footnote 9	--	
Lead <sup>9</sup> (Pb)	30 Day Average	1.5 µg/m <sup>3</sup>	Atomic Absorption	--	--	--
	Calendar Quarter	--		1.5 µg/m <sup>3</sup>	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average <sup>10</sup>	--		0.15 µg/m <sup>3</sup>		
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer – visibility of ten miles or more (0.07 – 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 µg/m <sup>3</sup>	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m <sup>3</sup> )	Ultraviolet Fluorescence			
Vinyl Chloride <sup>9</sup>	24 Hour	0.01 ppm (26 µg/m <sup>3</sup> )	Gas Chromatography			

Source: California Air Resources Board, September 8, 2010.

See table footnotes on the following page.

Footnotes:

- <sup>1</sup> California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter – PM<sub>10</sub>, PM<sub>2.5</sub>, and visibility reducing particles, are values that are not to be exceeded. All other are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
- <sup>2</sup> National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM<sub>10</sub>, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m<sup>3</sup> is equal to or less than one. For PM<sub>2.5</sub>, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.
- <sup>3</sup> Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
- <sup>4</sup> Any equivalent procedure which can be shown to the satisfaction of CARB to give equivalent results at or near the level of the air quality standard may be used.
- <sup>5</sup> National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
- <sup>6</sup> National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- <sup>7</sup> Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.
- <sup>8</sup> To attain this standard, the 3-year average of the 98<sup>th</sup> percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010). Note that the EPA standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively.
- <sup>9</sup> On June 2, 2010, the US EPA established a new 1-hour SO<sub>2</sub> standard, effective August 23, 2010, which is based on the 3-year average on the annual 99th percentile of 1-hour daily maximum concentrations. EPA also proposed a new automated Federal Reference Method (FRM) using ultraviolet technology, but will retain the older pararosaniline methods until the new FRM have adequately permeated State monitoring networks. The EPA also revoked both the existing 24-hour SO<sub>2</sub> standard of 0.14 ppm and the annual primary SO<sub>2</sub> standards of 0.030 ppm, effective August 23, 2010. The secondary SO<sub>2</sub> standard was not revised at that time; however, the secondary standard is undergoing a separate review by EPA. Note that the new standard is in units of ppb. California standards are in units of ppm. To directly compare the new primary national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
- <sup>10</sup> ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
- <sup>11</sup> National lead standard, rolling 3-month average: final rule signed October 15, 2008.

µg/m<sup>3</sup> = micrograms per cubic meter

CARB = California Air Resources Board

EPA = United States Environmental Protection Agency

mg/m<sup>3</sup> = milligrams per cubic meter

ppm = parts per million

**Table 2.13-2 South Coast Air Basin Air Quality Attainment Status**

Pollutant	State	Federal	Health and Atmospheric Effects
Carbon Monoxide (CO)	Attainment	Attainment/Maintenance	Asphyxiant. CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen.
Ozone (O <sub>3</sub> ) (1-hour standard)	Extreme Nonattainment	Revoked June 2005	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include a number of known toxic air contaminants.
Ozone (O <sub>3</sub> ) (8-hour standard)	Unclassified	Extreme Nonattainment <sup>1</sup>	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include a number of known toxic air contaminants.
Nitrogen Dioxide (NO <sub>2</sub> )	Attainment	Attainment/Maintenance	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain.
Sulfur Dioxide (SO <sub>2</sub> )	Attainment	Attainment	Irritates respiratory tract; injures lung tissue. Can have yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.
Particulate Matter <10 microns (PM <sub>10</sub> )	Nonattainment	Serious Nonattainment <sup>2</sup>	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM <sub>10</sub> .
Particulate Matter <2.5 microns (PM <sub>2.5</sub> )	Nonattainment	Nonattainment <sup>3</sup>	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – considered a toxic air contaminant – is in the PM <sub>2.5</sub> size range. Many aerosol and solid compounds are part of PM <sub>2.5</sub> .

Sources: California Air Resources Board, *Area Designations*, accessed November 2009. (<http://www.arb.ca.gov/desig/desig.htm>); and U.S. Environmental Protection Agency (EPA), *The Green Book Nonattainment Areas for Criteria Pollutants*, accessed November 2009. (<http://www.epa.gov/air/oaqps/greenbk>).

1. Effective June 2010, the federal 8-hour ozone nonattainment status was changed to extreme with an attainment date of 2024.

2. The EPA eliminated the annual PM<sub>10</sub> standard in its final rule revision in October 2006.

3. The PM<sub>2.5</sub> nonattainment designation is based on the 1997 standard. In 2006, the EPA revised the 24-hour standard. The 2006 new PM<sub>2.5</sub> standard of 35 µg/m<sup>3</sup> applies 1 year after the effective date of the new designation (April 2010).

µg/m<sup>3</sup> = micrograms per cubic meter

SCAQMD = South Coast Air Quality Management District

**Table 2.13-3 Local Air Quality Levels**

Pollutant	Primary Standard		Year	Maximum Concentration <sup>1</sup>	Number of Days State/Federal Standard Exceeded
	California	Federal			
Carbon Monoxide (CO) <sup>2</sup>	9.0 ppm for 8 hours	9.0 ppm for 8 hours	2006 2007 2008	1.64 ppm 2.16 1.10	0/0 0/0 0/0
Ozone (O <sub>3</sub> ) <sup>2</sup> (1-Hour)	0.09 ppm for 1 hour	N/A	2006 2007 2008	0.123 ppm 0.108 0.118	13/NA 5/NA 9/NA
Ozone (O <sub>3</sub> ) <sup>2</sup> (8-Hour)	0.07 ppm for 8 hours	0.075 ppm for 8 hours	2006 2007 2008	0.105 ppm 0.090 0.104	23/12 10/5 25/15
Nitrogen Dioxide (NO <sub>x</sub> ) <sup>3</sup>	0.18 ppm for 1 hour	0.100 ppm	2006 2007 2008	0.101 ppm 0.074 0.081	0/NA 0/NA 0/NA
Sulfur Dioxide (SO <sub>2</sub> ) <sup>3</sup>	0.25 ppm for 1 hour	0.14 ppm for 24 hours or 0.03 ppm annual arithmetic mean	2006 2007 2008	0.005 ppm 0.004 0.003	N/A N/A N/A
Particulate Matter (PM <sub>10</sub> ) <sup>2, 4, 5</sup>	50 µg/m <sup>3</sup> for 24 hours	150 µg/m <sup>3</sup> for 24 hours	2006 2007 2008	57.0 µg/m <sup>3</sup> 74.0 42.0	1/0 3/0 0/0
Fine Particulate Matter (PM <sub>2.5</sub> ) <sup>2,5</sup>	No Separate State Standard	35 µg/m <sup>3</sup> for 24 hours	2006 2007 2008	46.9 µg/m <sup>3</sup> 46.8 31.9	NM/1 NM/2 NM/0

Source: California Air Resources Board, *ADAM Air Quality Data Statistics*, <http://www.arb.ca.gov/adam/welcome.html>.

<sup>1</sup> Maximum concentration is measured over the same period as the California Standard.

<sup>2</sup> Measurements taken at the Mission Viejo Monitoring Station located at 26081 Via Pera, Mission Viejo, California.

<sup>3</sup> Measurements taken at the Costa Mesa Monitoring Station located at 2850 Mesa Verde Drive, Costa Mesa, California.

<sup>4</sup> PM<sub>10</sub> exceedances are based on State thresholds established prior to amendments adopted on June 20, 2002.

<sup>5</sup> PM<sub>10</sub> and PM<sub>2.5</sub> exceedances are derived from the number of samples exceeded, not days.

µg/m<sup>3</sup> = micrograms per cubic meter

ADAM = Aerometric Data Analysis and Management System

NA = Not Applicable

NM = Not Measured

PM<sub>2.5</sub> = particulate matter 2.5 microns in diameter or less

PM<sub>10</sub> = particulate matter 10 microns in diameter or less

ppm = parts per million

10 ft above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. The following pollutants are monitored within the vicinity of the project study area:

- CO
- O<sub>3</sub>
- NO<sub>2</sub>
- Sulfur oxide (SO<sub>x</sub>) (or SO<sub>2</sub>)
- PM<sub>10</sub>
- PM<sub>2.5</sub>
- Total Suspended Particulates and Visibility



- VOCs (or Reactive Organic Gases [ROG])
- Pb

### **2.13.2.5 Diesel Particulate Matter**

Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is commonly found throughout the environment and is estimated by the EPA's National Scale Assessment to contribute to human health risk. Diesel exhaust is composed of two phases, either gas or particle, and both phases contribute to the risk. The gas phase is composed of many of the urban hazardous air pollutants such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde, and polycyclic aromatic hydrocarbons. The particle phase also has many different types of particles that can be classified by size or composition. The size of diesel particulates that are of greatest health concern are those that are in the categories of fine and ultrafine particles. The composition of these fine and ultrafine particles may be composed of elemental carbon with adsorbed compounds such as organic compounds, sulfate, nitrate, metals, and other trace elements. Diesel exhaust is emitted from a broad range of diesel engines: the on-road diesel engines of trucks, buses, and cars, and off-road diesel engines that include locomotives, marine vessels, and heavy-duty equipment.

## **2.13.3 Environmental Consequences**

### **2.13.3.1 Consistency with Applicable Plans/Conformity Determination**

Nonattainment/maintenance areas are subject to the Transportation Conformity Rule, which requires local transportation and air quality officials to coordinate planning to ensure that transportation projects such as road construction do not affect an area's ability to reach its clean air goals. Transportation conformity requirements become effective one year after an area is designated as nonattainment.

The federal Clean Air Act Amendments (CAAA) of 1990 require that transportation plans, program, and projects that are funded by or approved under Title 23 of the United States Code (USC) or the Federal Transit Act conform to State or federal air quality plans. To be in conformance, a project must come from approved transportation plans and programs such as the SIP, RTP, and FTIP. SCAG, as the federally recognized Metropolitan Planning Organization (MPO) and the designated regional transportation planning agency, is responsible for preparing the RTP and FTIP. As part of its regional planning responsibilities, SCAG prepared the demographic projections and integrated land use, housing, employment, and transportation programs, measures, and strategies portions of the Air Quality Management Plan (AQMP). These projections are used for determining conformity to the AQMP for proposed federal projects, plans, and programs.

As stated above, and shown in Table 2.13-2, the SCAB is an attainment area for CO, NO<sub>2</sub>, and SO<sub>2</sub> for both State and federal standards and a nonattainment area for O<sub>3</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> under both State and federal standards. Therefore, a hot-spot analysis is required in nonattainment and maintenance areas for CO, PM<sub>10</sub>, and PM<sub>2.5</sub>.

The I-5 HOV Lane Extension Project was included in the regional emissions analysis conducted by SCAG for the conforming 2008 RTP. The 2008 RTP includes the following project description: Interstate 5 from Coast Highway to Avenida Pico – Add 1 HOV lane each direction. The project’s design concept and scope have not changed significantly from what was analyzed in the 2008 RTP. This analysis found that the plan and, therefore, the individual projects contained in the plan, are conforming projects and will have air quality impacts consistent with those identified in the SIPs for achieving the NAAQS. FHWA determined the RTP to conform to the SIP on June 5, 2008.

The I-5 HOV Lane Extension Project is programmed in the SCAG adopted 2011 FTIP as “I-5 From Coast Highway to Avenida Pico: Add 1 HOV Lane Each Direction (2H01143).” The 2008 RTIP includes the following project description: I-5 at Avenida Pico to Pacific Coast Highway – Add 1 HOV lane each direction and Avenida Pico Interchange Improvement. The year that the project is expected to open to the public is consistent with (within the same regional emission analysis period as) the construction completion date identified in the federal RTIP and/or RTP. The federal RTIP gives priority to eligible Transportation Control Measures (TCMs) identified in the SIP and provides sufficient funds to provide for their implementation. FHWA determined the RTIP to conform to the SIP on November 17, 2008.

FHWA issued a project-level air quality conformity determination for the proposed project on June 5, 2010. Information pertaining to the hot-spot analysis for CO, PM<sub>10</sub>, and PM<sub>2.5</sub> is provided below. The conformity determination letter states that the project would not create any new violation of air quality standards or increase the severity or number of existing air quality violations in the SCAG region.

### **2.13.3.2 Temporary Impacts**

#### ***Alternative 1 – No Build Alternative***

Alternative 1, the No Build Alternative proposes no improvements to I-5, maintaining the existing four general-purpose lanes throughout the project limits. As a result, no construction-related activities would occur with Alternative 1, and there would be no short term construction-related impacts.

### **Build Alternatives 2 and 4 – Design Options A and B**

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are anticipated and would include CO, nitrogen oxides (NO<sub>x</sub>), VOCs, directly-emitted particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and toxic air contaminants such as diesel exhaust particulate matter. O<sub>3</sub> is a regional pollutant that is derived from NO<sub>x</sub> and VOCs in the presence of sunlight and heat.

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, removing or improving existing roadways, and paving roadway surfaces. Construction-related effects on air quality from most highway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. If not properly controlled, these activities would temporarily generate PM<sub>10</sub>, PM<sub>2.5</sub>, and small amounts of CO, SO<sub>2</sub>, NO<sub>x</sub>, and VOCs. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM<sub>10</sub> emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM<sub>10</sub> emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Construction activities for large development projects are estimated by the EPA to add 1.09 tonne (1.2 tons) of fugitive dust per acre of soil disturbed per month of activity. If water or other soil stabilizers are used to control dust, the emissions can be reduced by up to 50 percent. The Caltrans Standard Specifications (Section 10) pertaining to dust minimization requirements requires use of water or dust palliative compounds and will reduce potential fugitive dust emissions during construction.

In addition to dust-related PM<sub>10</sub> emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO<sub>2</sub>, NO<sub>x</sub>, VOCs and some soot particulate (PM<sub>10</sub> and PM<sub>2.5</sub>) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

SO<sub>2</sub> is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Off-road diesel fuel meeting Federal Standards can contain up to 5,000 parts per million (ppm) of sulfur, whereas on-road diesel is restricted to less than 15 ppm of sulfur. However, under California law and CARB regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel, so SO<sub>2</sub>-related issues due to diesel exhaust will be minimal. Some phases of construction, particularly asphalt paving, would result in short-term odors in the immediate area of each paving site(s). Such odors would be quickly dispersed below detectable thresholds as distance from the site(s) increases.

Alternative 2 would remove the existing I-5 paved shoulders and construct new pavement to the outside of the northbound and southbound lanes to accommodate an HOV lane. Additionally, Alternative 2 would improve the Avenida Pico interchange. Short-term impacts to air quality would occur during pavement removal and construction activities. Additional sources of construction-related emissions include:

- Exhaust emissions and potential odors from construction equipment used on the construction site, as well as the vehicles used to transport materials to and from the site
- Exhaust emissions from the motor vehicles of the construction crew

Construction of the proposed project is anticipated to commence in 2015 and be completed by 2019. However, no temporary road or intersection closures during construction are anticipated to last longer than two years. As a result, no hot-spot analysis or short-term air quality effects associated with temporary road or intersection closures are necessary. If any temporary road or intersection closures during construction last longer than two years, a hot-spot analysis would be required. As a result, project construction would not last more than five years and is considered temporary. Stationary or mobile-powered on-site construction equipment would include trucks, tractors, signal boards, excavators, backhoes, concrete saws, crushing and/or processing equipment, graders, trenchers, pavers, and other paving equipment.

Alternative 4 has similar improvements as Alternative 2; however, Alternative 4 proposes continuous access, as opposed to the four ft buffer proposed in Alternative 2. In addition, Alternative 4 would provide a standard 10 ft median shoulder for the northern portion of the compound curve. Like Alternative 2, construction of Alternative 4 is anticipated to commence in 2015 and be completed by 2019.

In order to further minimize construction-related emissions, all construction vehicles and construction equipment would be required to be equipped with State-mandated emission control devices pursuant to State emission regulations and standard construction practices.

Short-term construction particulate matter emissions would be further reduced through the implementation of dust suppression measures outlined in SCAQMD Rules 402 and 403. Caltrans Standard Specifications for Construction (Section 10 and 18 [Dust Control] and Section 39-3.06 [Asphalt Concrete Plants]) would also be adhered to.

The proposed project would comply with any State, federal, and/or local rules and regulations developed as a result of implementing control and mitigation measures proposed as part of their respective SIPs. After construction of the proposed project is complete, all construction-related impacts would cease, thus resulting in a less than significant impact. Therefore, project construction is not anticipated to violate State or federal air quality standards or contribute to the existing air quality violations in the SCAB.

#### *Construction Diesel Particulate Matter*

While there may possibly be diesel toxics emissions from the construction of a transportation project, the current scientific knowledge on diesel toxics is simply inadequate for conducting any meaningful quantitative assessment. The FHWA issued an *Interim Guidance on Air Toxic Analysis in NEPA Documents*. It points out that “. . . air toxics analysis is an emerging field, and current scientific techniques, tools, and data are not sufficient to accurately estimate human health impacts that would result from a transportation project in a way that would be useful to decision-makers.” The FHWA interim guidelines are used as a reference tool only.

The FHWA interim guidance suggests a number of mitigation measures for diesel toxics emissions from project construction. These measures can be summarized into three categories: (1) operational agreements, such as changing work shifts and reducing unnecessary engine idling; (2) technological adjustments and retrofits, such as particulate matter traps and oxidation catalysts; and (3) use of clean fuels, such as ultra-low sulfur diesel. However, it should be noted that with the current absence of any statewide or local regulation, the Department does not have the legal authority to require construction contractors to undertake any of these measures. It may only be possible for the Department to request that some of these measures be employed on a case-by-case basis. However, when working with the contractors on this construction project, efforts would

be undertaken to minimize diesel toxic emissions to the extent feasible. Therefore, the proposed project would have less than significant impacts regarding DPM.

### **2.13.3.3 Permanent Impacts**

#### ***Alternative 1 – No Build Alternative***

There is the potential for air pollutant emissions to increase in the long term as the LOS within the project limits continues to deteriorate in the future because of increasing traffic congestion. Under the No Build Alternative scenario, the project limits would operate at a LOS of mostly D and F during peak traffic hours in year 2040; therefore, a potential deterioration in air quality at the project location is anticipated.

Alternative 1, the No Build Alternative, would not result in any improvements to I-5; the existing four general-purpose lanes would be maintained throughout the project limits. As a result, no modifications to I-5 would occur, and neither a CO hotspot analysis nor a particulate matter hot spot analysis would be required. Therefore, Alternative 1, the No Build Alternative, would not have impacts regarding CO hotspots, particulate matter hotspots, DPM exhaust, mobile source air toxics, or naturally occurring asbestos.

#### ***Build Alternatives 2 and 4 – Design Options A and B***

##### ***Carbon Monoxide***

Alternative 2 would remove the existing I-5 paved shoulders to construct new pavement to the outside of the northbound and southbound lanes to accommodate an HOV lane. Additionally, Alternative 2 would improve the Avenida Pico interchange. Alternative 4 has improvements similar to Alternative 2. Alternative 4 would not change the traffic volumes, fleet mixes, or level of service from what was analyzed in Alternative 2.

A qualitative hot-spot analysis is defined in 40 CFR 93.101 as an estimation of likely future localized pollutant concentrations resulting from a new transportation project and a comparison of those concentrations to the relevant air quality standard. A hot-spot analysis assesses the air quality impacts on a scale smaller than an entire nonattainment or maintenance area, including, for example, congested roadway intersections and highways or transit terminals. Such an analysis is a means of demonstrating that a transportation project meets federal Clean Air Act (FCAA) conformity requirements to support state and local air quality goals with respect to potential localized air quality impacts.

A CO hot-spot analysis was conducted per the 1997 Transportation Project-Level Carbon Monoxide Protocol (CO Protocol) developed by the Institute of Transportation Studies at the University of California, Davis. The analysis concluded that implementation of the

proposed project would alleviate several peak-hour mainline and freeway ramp deficiencies and would reduce congestion. The proposed project involves the extension of HOV lanes that would reduce conflicts and enhance vehicular circulation. Additionally, the proposed project does not involve parking lots and therefore would not increase the number of vehicles operating in cold start mode. As a result, the proposed project has sufficiently addressed the potential CO impact, project impacts would be less than significant, and no further analysis or mitigation is needed.

#### *Operational Diesel Particulate Matter*

The EPA again published a final rule on March 10, 2006 (effective as of April 5, 2006) and established conformity criteria and procedures for transportation projects to determine their impacts on ambient PM<sub>10</sub> levels in nonattainment and maintenance areas. The March 10, 2006, final rule requires a qualitative PM<sub>10</sub> hot-spot analysis to be completed for a project of air quality concern (POAQC). In order to implement the hot-spot analysis requirements of the March 10, 2006, final rule, the Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM<sub>2.5</sub> and PM<sub>10</sub> Nonattainment and Maintenance Areas (2006 Guidelines) were developed by the EPA and the FHWA. The proposed project is within a nonattainment area for federal PM<sub>2.5</sub> and PM<sub>10</sub> standards; therefore, analyses are required for conformity purposes, but hot-spot analyses (either qualitative or quantitative) are not required because the project is not a POAQC.

The proposed project does not qualify as a POAQC pursuant to the March 10, 2006, final rule. The proposed project is not a new highway project that would have a significant number of, or increase in, diesel vehicles. The project would widen I-5 to extend the HOV lane in the northbound and southbound direction in order to achieve a higher person-carrying capacity and to improve air quality along this corridor. Implementation of the proposed project would achieve the objectives to improve overall performance within the project limits and to relieve local street congestion within the interchange areas.

Additionally, the proposed project does not affect intersections that are at LOS D, E, or F with a significant number of diesel vehicles. As noted above, implementation of the project would enhance traffic flow along this segment of I-5. The proposed project would not result in significant changes in traffic volume, vehicle mix, or other factors that would cause an increase in emissions compared to the No Build condition. Implementation of the proposed project would not change interchange LOS significantly between Build and

No Build conditions. Lastly, implementation of the proposed project would alleviate several peak-hour mainline and freeway ramp deficiencies, thereby reducing congestion.

The 2008 RTP was found by the FHWA/Federal Transit Administration (FTA) to conform to the SIP on June 15, 2008, and the 2008 RTIP was found conforming on November 17, 2008. This hot-spot analysis is based on assumptions from the 2008 RTP and RTIP, the City of San Juan Capistrano General Plan, the City of Dana Point General Plan, and the City of San Clemente General Plan.

As part of the hot-spot conformity criteria, interagency consultation was required. The proposed project was submitted to stakeholders at a Transportation Conformity Working Group (TCWG) meeting on February 23, 2010, pursuant to the interagency consultation requirement of 40 CFR 93.105 (c)(1)(i). The Department, EPA, CARB, SCAQMD, and other interagency consultation participants reviewed additional information, including the detailed particulate matter analysis and CT-EMFAC model outputs. Upon review, the TCWG members concurred with the finding that the proposed project was not a POAQC due to the nominal differences in diesel truck volumes between the Build and No Build scenarios, the HOV lane extension would not add significant diesel truck capacity, and the auxiliary lanes and interchange modifications would not be a major truck traffic generator. Additionally, the proposed project represents the implementation of a TCM and would reduce congestion as well as merging and weaving conflicts. Therefore, the proposed project would not be considered a POAQC and would be considered exempt under 40 CFR 93.126, as it would not create a new, or worsen an existing, PM<sub>2.5</sub> or PM<sub>10</sub> violation.

### *Mobile Source Air Toxics*

In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Controlling air toxic emissions became a national priority with the passage of the CAAAs, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in its latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in its Integrated Risk Information System (IRIS).<sup>1</sup> In

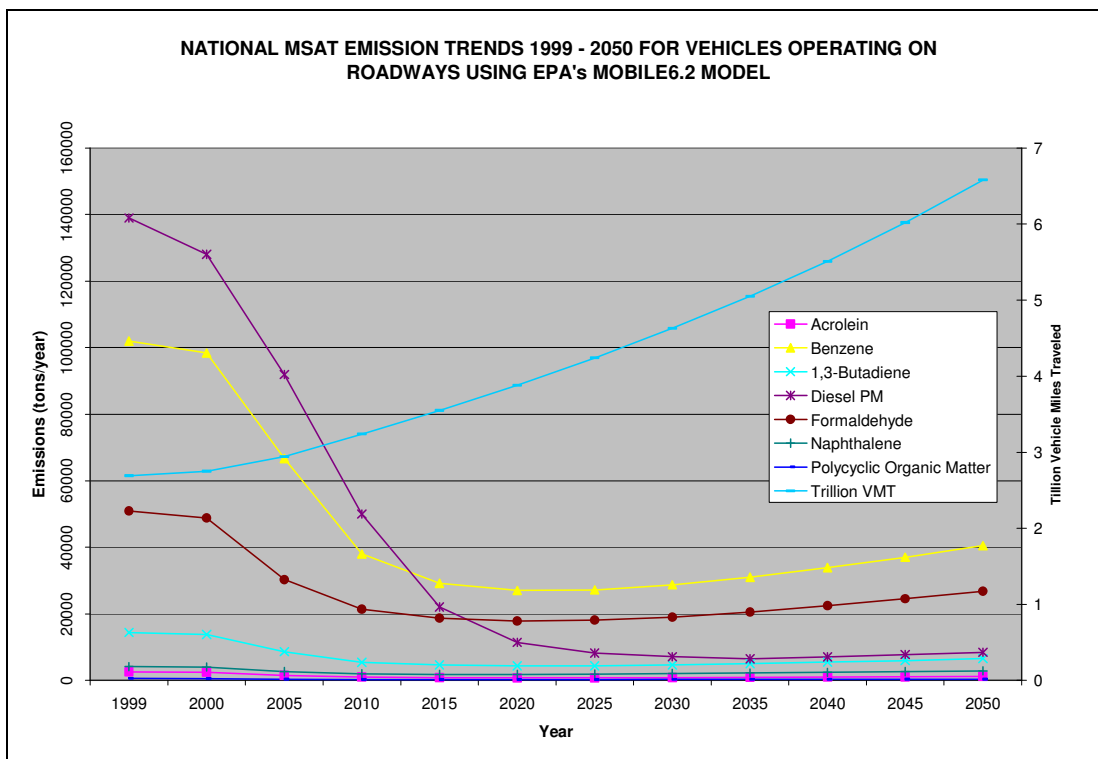
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<sup>1</sup> <http://www.epa.gov/ncea/iris/index.html>



addition, the EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from its 1999 National Air Toxics Assessment (NATA)<sup>1</sup>. These are acrolein, benzene, 1,3-butadiene, DPM plus diesel exhaust organic gases, formaldehyde, naphthalene, and polycyclic organic matter (POM). While the FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA rule described above requires controls that will dramatically decrease Mobile Source Air Toxics (MSAT) emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using the EPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles traveled, VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in the figure below. The projected reduction in MSAT emissions would be slightly different in California due to the use of the EMFAC2007 emission model in place of the MOBILE6.2 model.



<sup>1</sup> <http://www.epa.gov/ttn/atw/nata1999/>

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA.

In September 2009, the FHWA issued guidance<sup>1</sup> to advise FHWA division offices as to when and how to analyze MSATs in the NEPA process for highways. This document is an update to the guidance released in February 2006. The guidance is described as interim because MSAT science is still evolving. As the science progresses, FHWA will update the guidance. This analysis follows the FHWA guidance.

### ***Information that is Unavailable or Incomplete***

In the FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. It is the lead authority for administering the CAA and its amendments and has specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants, and maintains IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects."<sup>2</sup> Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of the FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects

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<sup>1</sup> <http://www.fhwa.dot.gov/environment/airtoxic/100109guidmem.htm>.

<sup>2</sup> EPA, <http://www.epa.gov/ncea/iris/index.html>.

linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations<sup>1</sup> or in the future as vehicle emissions substantially decrease.<sup>2</sup>

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts. Each step in the process builds on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified due to required lifetime (i.e., 70-year) exposure methodologies, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable. The results produced by the EPA's MOBILE 6.2 model, the California EPA's Emfac2007 model, and the EPA's Draft Motor Vehicle Emission Simulator (MOVES) 2009 model in forecasting MSAT emissions are highly inconsistent. Indications from the development of the MOVES model are that MOBILE 6.2 significantly underestimates diesel PM emissions and significantly overestimates benzene emissions.

Regarding air dispersion modeling, an extensive evaluation of the EPA's guideline CAL3QHC model was conducted in an NCHRP study,<sup>3</sup> which documents poor model performance at ten sites across the country; three where intensive monitoring was conducted plus an additional seven with less intensive monitoring. The study indicates a bias of the CAL3QHC model to overestimate concentrations near highly congested intersections and underestimate concentrations near uncongested intersections. The consequence of this is a tendency to overstate the air quality benefits of mitigating congestion at intersections. Such poor model performance is less difficult to manage for demonstrating compliance with NAAQS for relatively short time frames than it is for forecasting individual exposure over an entire lifetime, especially given that some information needed for estimating 70-year lifetime exposure is unavailable. It is particularly difficult to forecast MSAT exposure near

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<sup>1</sup> HEI, <http://pubs.healtheffects.org/view.php?id=282>.

<sup>2</sup> HEI, <http://pubs.healtheffects.org/view.php?id=306>.

<sup>3</sup> EPA, [http://www.epa.gov/scram001/dispersion\\_alt.htm#hyroad](http://www.epa.gov/scram001/dispersion_alt.htm#hyroad).

roadways reliably, and to determine the portion of time that people are actually exposed at a specific location.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by the HEI.<sup>1</sup> As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA<sup>2</sup> and the HEI<sup>3</sup> have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the CAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires the EPA to determine a “safe” or “acceptable” level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld the EPA’s approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of these limitations in the methodologies for forecasting health impacts, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision-makers, who would need to weigh this information against project benefits, such as reducing traffic

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<sup>1</sup> <http://pubs.healtheffects.org/view.php?id=282>

<sup>2</sup> <http://www.epa.gov/risk/basicinformation.htm#g>

<sup>3</sup> <http://pubs.healtheffects.org/getfile.php?u=395>

congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

### **Project Emissions**

The proposed project would improve vehicular traffic and circulation and would not create a facility that is likely to meaningfully increase MSATs. However, the proposed project involves traffic volumes where ADT is currently greater than 150,000. As a result, a quantitative analysis for projects with higher potential MSAT effects (Tier 3) is provided below.

Table 2.13-4 presents the estimated MSAT emissions from traffic on I-5; refer to Appendix C. The data indicate that MSAT emissions would not vary significantly between future Build and No Build conditions. As depicted in Table 2.13-4, emissions would not change for most MSATs. However, butadiene and benzene would decrease slightly during Build conditions. This may be attributed to an improvement in vehicle speeds and an overall decrease in peak-hour VMT.

**Table 2.13-4 Build and No Build  
Emissions on I-5**

<b>Mobile Source Air Toxins</b>	<b>No Build (pounds)</b>	<b>Build (pounds)</b>
Diesel Particulate Matter	34.47	34.47
Formaldehyde	21.75	21.75
Butadiene	4.90	4.88
Benzene	25.35	21.64
Acrolein	1.11	1.11
Acetaldehyde	7.01	7.01

Source: California Department of Transportation and University of California, Davis, *CT-EMFAC*, 2007. Based on traffic data provided by Austin-Foust Associates, Inc.  
CT = California Department of Transportation (Department)  
EMFAC = emission factors  
I-5 = Interstate 5

CARB has found that DPM poses the greatest cancer risks among all identified air toxics. Diesel trucks contribute more than half of the total diesel combustion sources. However, CARB has adopted a Diesel Risk Reduction Plan (DRRP) with control measures that would reduce the overall DPM emissions by approximately 85 percent from 2000 to 2020. These reduction measures are not reflected in the CTEMFAC emission factors used in the analysis above. Therefore, future DPM emissions would be reduced beyond what is indicated in Table 2.13-4. In addition, total toxic risk from diesel exhaust may only be exposed for a much shorter duration. Further, DPM is

only one of many environmental toxics, and those of other toxics and other pollutants in various environmental media may overshadow its cancer risks. Thus, while diesel exhaust may pose potential cancer risks, most receptors' short-term exposure would cause only minimal harm, and these risks would also greatly diminish in the future operating years of the proposed project due to planned emission control regulations.

### *Naturally Occurring Asbestos/Structural Asbestos*

Chrysotile and amphibole asbestos (such as tremolite) occur naturally in certain geologic settings in California, most commonly in association with ultramafic rocks and along associated faults. Asbestos is a known carcinogen, and inhalation of asbestos may result in the development of lung cancer or mesothelioma. The asbestos content of many manufactured products has been regulated in the U.S. for a number of years. For example, CARB has regulated the amount of asbestos in crushed serpentinite used in surfacing applications, such as for gravel on unpaved roads, since 1990. In 1998, new concerns were raised about possible health hazards from activities that disturb rocks and soil containing asbestos and may result in the generation of asbestos-laden dust. These concerns recently led CARB to revise its asbestos limit for crushed serpentinite and ultramafic rock in surfacing applications from five percent to less than 0.25 percent and to adopt a new rule requiring BMPs dust control measures for activities that disturb rock and soil containing naturally occurring asbestos.

The California Division of Mines and Geology (CDMG) Geological Map Index was searched for available geological maps that cover the project study area and surrounding areas. These geological maps indicate geological formations, which are overlaid on a topographic map. Some maps focus on specific issues (i.e., bedrock, sedimentary rocks), while others may identify artificial fills (including landfills). Geological maps can be effective in estimating permeability and other factors that influence the spread of contamination. According to CDMG maps, the project study area is generally in an urban land area underlain by a stratified sequence from the Quaternary Period and consists of alluvial floodplain deposits. Additionally, according to the CDMG document titled *A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos Report* (August 2000), the proposed project is not located in an area where naturally occurring asbestos (NOA) is likely to be present.

NOA in bedrock is typically associated with serpentine and peridotite deposits. Note that during demolition activities, the likelihood of encountering structural asbestos is low due to the nature of the demolished materials. The material would consist of concrete and metal piping. Therefore, the potential for NOA to be present within the project limits is

considered to be low. Furthermore, prior to the commencement of construction, qualified geologists would further examine the soils and makeup of the existing structure. Should the project geologist encounter asbestos during the analysis, proper steps shall be executed to handle the materials.

#### **2.13.4 Avoidance, Minimization, and/or Mitigation Measures**

No avoidance, minimization, and/or mitigation measures are required for operational air quality impacts, as the proposed project would not produce substantial operational air quality impacts. The following avoidance and minimization measures shall be utilized to reduce and otherwise address particulate emissions during construction.

**AQ-1** To reduce fugitive dust emissions, the construction contractor shall adhere to the requirements of South Coast Air Quality Management District (SCAQMD) Rule 403 during construction. These Best Available Control Measures (BACMs) specified in SCAQMD's Rule 403 shall be incorporated into the project construction. BACMs shall include, but not be limited to, the following:

- a) All construction site areas shall be watered at least twice daily.
- b) All trucks hauling soils, sand, gravel, and other loose materials shall be covered or required to maintain at least two ft of freeboard space.
- c) All paved access roads, parking areas, and staging areas at the construction site shall be swept at least twice daily.
- d) A nontoxic soil stabilizer or hydroseed shall be applied to parts of the construction site that are inactive for 10 or more days.
- e) Exposed dirt or sand stockpiles shall be enclosed, covered, or watered twice daily.
- f) Vehicle speeds shall be limited to 15 miles per hour in active construction areas.
- g) Construction equipment shall be scheduled to maximize use rates and minimize idling times.
- h) California Air Resources Board certified gasoline and diesel fuels shall be used in the construction equipment.

**AQ-2** During clearing, grading, earth-moving, or excavation operations, excessive fugitive dust emissions shall be controlled by regular watering or other dust preventive measures using the following procedures, as specified in SCAQMD's Rule 403.

- All material excavated or graded shall be sufficiently watered to prevent excessive amounts of dust. Watering shall occur at least twice daily with complete coverage, preferably in the late morning and after work is done for the day.
- All material transported on site or off site shall be either sufficiently watered or securely covered to prevent excessive amounts of dust.
- The area disturbed by clearing, grading, earth moving, or excavation operations shall be minimized so as to prevent excessive amounts of dust.
- Visible dust beyond the property line emanating from the project shall be prevented to the maximum extent feasible.
- These control techniques shall be indicated in project specifications.

- AQ-3** Project grading plans shall show the duration of construction. Ozone precursor emissions from construction equipment vehicles shall be controlled by maintaining equipment engines in good condition and in proper tune per manufacturer's specifications.
- AQ-4** All trucks that are to haul excavated or graded material on site shall comply with State Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(2) and (e)(4), as amended, regarding the prevention of such material spilling onto public streets and roads.
- AQ-5** The contractor shall adhere to California Department of Transportation (Caltrans) Standard Specifications for Construction (Sections 10 and 18 [Dust Control] and Section 39-3.06 [Asphalt Concrete Plant Emissions]).
- AQ-6** Should the project geologist determine that asbestos-containing materials (ACMs) are present at the project study area during final inspection prior to construction, the appropriate methods shall be implemented to remove ACMs.